

PATENT ABSTRACTS OF JAPAN

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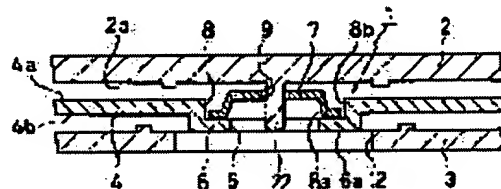
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(54) DISK CARTRIDGE

(57)Abstract:

PURPOSE: To hold a metallic plate in a loose fitting state to a disk substrate without slipping out of the disk substrate without subjecting to a swaging processing and to greatly improve the reliability of a recording disk.

CONSTITUTION: In a cartridge composed of a pair of upper and lower halves 2, 3, a magneto-optical disk 1 is freely rotably housed. In the magneto-optical disk 1, the metallic plate 7 for chucking is disposed in a metallic plate housing recessed part 8 formed in a central part of the magneto-optical disk 1. At this time, a projecting part 22 which is engaged to a central hole 9 installed at the central part of the metallic plate 7 is provided at an inner surface of the upper half 2.



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CLAIMS

[Claim(s)]

[Claim 1] With the half of the vertical pair which comes to form an optical head, the 1st opening which counters, and the 2nd opening in which a disk rotation driving means is inserted only in one of halves It comes to have the metal plate for chucking arranged in the crevice formed in the core of the record disk contained free [rotation in these halves], and the above-mentioned record disk. The disk cartridge characterized by preparing the lobe which engages with the feed hole established in the core of the above-mentioned metal plate in the inside of the half in whom the 2nd opening of the above is not formed.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the attaching structure of the metal plate arranged by especially the record disk about the disk cartridge by which a cartridge comes to contain **** record disks, such as an optical disk and a magneto-optic disk, pivotable.

[0002]

[Description of the Prior Art] Conventionally, the disk for information signal record with which a desired information signal is recorded is proposed like the optical disk or the magneto-optic disk. Since high density record of an information signal is possible for this kind of disk, the thing of a minor diameter is proposed extremely. For example, the optical disk or magneto-optic disk made as it is possible is proposed [record / for abbreviation 74 minutes] by 64mm of abbreviation, nothing, and the musical-sound signal in the diameter.

[0003] Thus, it is a minor diameter, and a disk rotation driving gear is equipped with the magneto-optic disk made as high density record of an information signal is possible, and rotation actuation is carried out at high speed. And record of a desired information signal is performed by impressing the external magnetic field by which the field modulation was carried out according to the information signal which should be recorded on the detailed recording track established in the information signal record layer formed in one principal plane of a magneto-optic disk from external magnetic field generators, such as the magnetic head, while irradiating the light beam by which outgoing radiation is carried out from an optical pickup where a rotation drive is carried out at high speed.

[0004] Thus, while a rotation drive is carried out at high speed, in order to irradiate a light beam correctly in a detailed recording track, the center of rotation is positioned in the axial center of the above-mentioned disk table with high precision, and it needs to be equipped with a magneto-optic disk while uniting with the disk table of a disk rotation driving gear certainly. In order to attain this purpose, in the former, the disk wearing method which was made to carry out chucking of the above-mentioned magneto-optic disk on the disk table is proposed by arranging the metal plate which is from a magnetic material on a magneto-optic-disk side, and drawing in with the magnet which prepared this in the disk table side.

[0005] The magneto-optic disk 101 used for the magnet chucking method using the suction force of this magnet is arranged free [rotation] in the cartridge which consists of halves 102, 103 of a vertical pair, as shown in drawing 5 . This magneto-optic disk 101 is equipped with the disk substrate 104 which comes to fabricate synthetic resin, such as transparent polycarbonate resin, in a disk configuration. The information signal record layer on which a desired information signal is recorded is formed in one principal plane 104a of this disk substrate 104. And when an information signal record layer irradiates a light beam to principal plane 104b of another side which while is formed and counters with principal plane 104a at a signal record layer from a write-in read-out side [of an information signal], and nothing and this write-in read-out side side, as for the above-mentioned disk substrate 104, record or playback of a desired information signal is performed.

[0006] Moreover, the circular centering hole 105 with which the centering member (illustration is omitted.) arranged in a disk rotation driving gear side is engaged is formed in the center section of the above-mentioned disk substrate 104. Furthermore, as the disc-like metal plate 106 which consists of a metallic material blockades the above-mentioned centering hole 105 in the center section by the side of one principal plane 104a of the above-mentioned disk substrate 104, it is arranged in it. That is, in the metal plate receipt crevice 107 which surrounded the centering hole 105, and was projected and formed in one principal plane 104a side of the above-mentioned disk substrate 104, as the above-mentioned metal plate 106 fits in, it is arranged. And receipt maintenance of this metal plate 106 is carried out to the above-mentioned disk substrate 104 by the overhang section 108 which makes the shape of a circular ring projected

and formed in the opening periphery section of the above-mentioned metal plate receipt crevice 107 toward the inner direction.

[0007]

[Problem(s) to be Solved by the Invention] By the way, the above-mentioned overhang section 108 is formed by carrying out sault EJINGU processing of the opening periphery section of the metal plate receipt crevice 107 of the disk substrate 104. That is, a horn is made to contact the opening periphery section of the metal plate receipt crevice 107, and the supersonic vibration from an ultrasonic wave oscillator is transmitted to this. Then, the part with which the horn of the metal plate receipt crevice 107 is in contact melts with frictional heat, the resin of this part *****s to a way among the above-mentioned crevices 107, it *****s in the form which overlaps the above-mentioned metal plate 106, and the section 108 is formed.

[0008] However, by the sault EJINGU processing method, since some disk substrates 104 are made to deform by supersonic vibration, a birefringence is affected depending on the condition and there is a possibility that a signal property may deteriorate. Moreover, problems, such as becoming easy to generate a crack in the overhang section 108, are also produced. Furthermore, when a metal plate 106 is fixed to the disk substrate 104, there is a possibility that the disk substrate 104 may deform from the difference of the coefficient of thermal expansion of these metal plates 106 and the disk substrate 104.

[0009] Then, in order to cancel this Prior-art-technical problem, this invention can make a metal plate hold to a disk substrate, without carrying out sault EJINGU processing, and aims at offering a disk cartridge with the high productivity excellent in dependability and the yield.

[0010]

[Means for Solving the Problem] With the half of the vertical pair which, as for this invention, comes to form an optical head, the 1st opening which counters, and the 2nd opening in which a disk rotation driving means is inserted only in one of halves It comes to have the metal plate for chucking arranged in the crevice formed in the core of the record disk contained free [rotation in these halves], and the above-mentioned record disk. It is characterized by preparing the lobe which engages with the feed hole established in the core of the above-mentioned metal plate in the inside of the half in whom the 2nd opening of the above is not formed.

[0011]

[Function] In this invention, since the lobe which engages with the feed hole established in the core of the metal plate for chucking at a half's inside is prepared, while the metal plate arranged in the crevice formed in the core of a record disk engages with this lobe and positioning to this record disk is made, it does not separate from this record disk. That is, since a metal plate will be held at a record disk, without carrying out sault EJINGU processing, change of the birefringence of the record disk concerned is lost and dependability improves.

[0012]

[Example] It explains to a detail, referring to a drawing hereafter about the concrete example which applied this invention. In addition, this example is an example of the disk cartridge which comes to contain a magneto-optic disk to a cartridge free [rotation] as a record disk. As shown in drawing 1 , the disk cartridge of this example has a magneto-optic disk 1 and the cartridge which consists of halves 2 and 3 of the vertical pair contained for this magneto-optic disk 1, enabling free rotation, and is constituted.

[0013] The above-mentioned magneto-optic disk 1 comes to have the disc-like disk substrate 4 which consists of transparent rigid resin ingredients, such as a polycarbonate. This disk substrate 4 is formed [thickness / 64mm, nothing, and] in the diameter as a disk considered as 1.2mm of abbreviation. The magneto-optic disk 1 constituted using this disk substrate 4 While coming to have the signal Records Department in which it comes to form the information signal record layer by which a desired information signal is recorded on one principal plane 4a side of the above-mentioned disk substrate 4 and making principal plane 4b of another side of this and the opposite side with the write-in read-out side of an information signal By irradiating a light beam from this write-in read-out side side at the above-mentioned information signal record layer, it is constituted so that record playback of said information signal may be performed. In addition, the musical-sound signal for a maximum of 72 minutes is recordable on the above-mentioned information signal record layer.

[0014] And the pin center,large hole 5 with which the centering member (illustration is omitted.) arranged in the core of the disk table which constitutes the disk rotation driving means arranged in a record regenerative apparatus is engaged is drilled in the center section of the disk substrate 4 which constitutes this magneto-optic disk 1. This pin center,large hole 5 penetrates the disk substrate 4 as a circular hole, is prepared, makes in agreement the core of this pin center,large hole 5, and is made and formed in the shape of a concentric circle, and the center of curvature of a recording track formed spirally at the above-mentioned signal record layer.

[0015] Moreover, as shown in drawing 2, the above-mentioned pin center, large hole 5 is surrounded in the center section by the side of principal plane 4b of another side of the above-mentioned disk substrate 4, and the metal plate stowage 6 which projects in the shape of a circular ring, and is prepared is formed in it in one. This metal plate stowage 6 functions as making the centering actuation which the center of rotation of nothing and the above-mentioned magneto-optic disk 1 is made in agreement with the axial center of the above-mentioned disk table, and is made to equip with the amount of protrusions to the above-mentioned pin center, large hole 5 of the centering member arranged in the disk table side on which it is equipped with this magneto-optic disk 1 greatly ensure, without making deep the depth of the pin center, large hole 5 drilled by the thick thin disk substrate 4. Furthermore, apical surface 6a of this metal plate stowage 6 functions as wearing datum level to the above-mentioned disk table.

[0016] Moreover, it is formed in the non-signal record section in which the information signal record layer by the side of the inner circumference of the disk substrate 4 is not formed at least, and the above-mentioned metal plate stowage 6 of abbreviation is in the thickness of the disk substrate 4 by carrying out, with the amount of protrusions, it projects and is formed. Therefore, the part in which the metal plate stowage 6 of the disk substrate 4 was formed is compared with the substrate body section, and is made with twice [about] as many thickness as this.

[0017] And the metal plate receipt crevice 8 which makes the shape of a circular ring in which the metal plate 7 for chucking which surrounds and mentions the pin center, large hole 5 later is arranged is formed in the center section by the side of one principal plane 4a of the above-mentioned disk substrate 4. This metal plate receipt crevice 8 is a minor diameter, and abbreviation's is in the thickness of the disk substrate 4 by carrying out, and it comes to form it in the depth from the diameter of a periphery of the above-mentioned metal plate stowage 6. Moreover, the diameter of opening inner circumference of the metal plate receipt crevice 8 is made more greatly than the diameter of opening of the above-mentioned pin center, large hole 5. Therefore, flat side 8a which makes the shape of a circular ring is prepared in the pars basilaris ossis occipitalis of this metal plate receipt crevice 8. This flat side 8a becomes the installation side in which the above-mentioned metal plate 7 is laid.

[0018] The metal plate 7 by which receipt maintenance is carried out is formed in the above-mentioned metal plate receipt crevice 8 by piercing metallic materials, such as a stainless plate, disc-like, and processing them. When receipt maintenance is carried out, this metal plate 7 is formed in this metal plate receipt crevice 8 at magnitude to which that peripheral face 7a does not contact inner skin 8b of the metal plate receipt crevice 8 concerned, while it is formed as a disk of the magnitude which is sufficient for being contained by the above-mentioned metal plate receipt crevice 8. Moreover, the small circular feed hole 9 used in order to handle on a production process is formed in the core of this metal plate 7.

[0019] On the other hand, a cartridge consists of magnitude which is sufficient for containing the above-mentioned magneto-optic disk 1, enabling free rotation, an upper half 2 of a vertical pair who makes the shape of a made rectangle, and a bottom half 3, and is formed as a thin case by comparing these.

[0020] While making the above top half 2 face a part of information signal record layer of the magneto-optic disk 1 contained in the cartridge, the opening window part 10 for head insertion which the magnetic head for impressing a field to this information signal record layer is made to face is prepared for him. This opening window part 10 for head insertion is formed as opening which makes the shape of a rectangle of the magnitude which is sufficient for covering inner circumference from a periphery and making the method of outside face the record section of an information signal record layer. In addition, in the disk cartridge only for playbacks, this opening window part 10 for head insertion cannot be found, and is made with the label side for printing or sticking a label etc.

[0021] The optical head built in the record regenerative apparatus, the 1st opening 11 which counters, and the 2nd opening 12 in which a disk rotation driving means is inserted are prepared for the bottom half 3 of the above. The 1st opening 11 of the above is established in the optical head built in a record regenerative apparatus, and the location which countered. That is, the 1st opening 11 of the above is formed as a notch which makes the shape of a flat-surface abbreviation rectangle covering the direction which carries out an abbreviation rectangular cross with the path of insertion to the above-mentioned equipment of the disk cartridge shown by the drawing 1 Nakaya mark X in the near section of the 2nd opening 12 from the section near the 1 side-face 3a of the bottom half 3 of the above. It is made by this 1st opening 11 as [attend / the principal plane section of another side of the magneto-optic disk 1 contained by the above-mentioned cartridge covers inner circumference, and / section / from that periphery, / the method of outside].

[0022] The 2nd opening 12 of the above is formed as a hole which makes the circle configuration of the magnitude which is sufficient for making the method of outside face the metal plate stowage 6 of the magneto-optic disk 1 contained to the above-mentioned cartridge. Magnetic adsorption of the metal plate 7 of the magneto-optic disk 1 contained by the above-mentioned cartridge is carried out, and the disk rotation driving means which carries out rotation actuation faces this 2nd opening 12 the magneto-optic disk 1 concerned.

[0023] And the shutter member 13 made as closing motion of the opening window part 10 for head insertion and the 1st opening 11 is free is formed in the cartridge which consists of vertical halves 2 and 3 constituted in this way. This shutter member 13 is supported movable in the direction of drawing 1 Nakaya mark A along with the lateral-surface section of a cartridge. The above-mentioned shutter member 13 consists of 1st closing motion Itabe 14 which carries out carrying out injection molding of the resin ingredients, such as plastics, etc., and it comes to form in one, and opens and closes the above-mentioned opening window part 10 for head insertion, 2nd closing motion Itabe 15 which opens and closes the 1st opening 11 of the above, and connection Itabe 16 who connects these.

[0024] Closing motion Itabe 14 of the above 1st is formed as a rectangular object of the magnitude which is sufficient for blockading the opening window part 10 for head insertion at least. Similarly, 2nd closing motion Itabe 15 is formed as the rectangular body of the magnitude which is sufficient for a wrap in the 1st opening 11 of the above. And connection Itabe 16 who connects these closing motion Itabe 14 and 15 was formed to the lateral-surface section of the above-mentioned cartridge as a plate which can ****, and has connected closing motion Itabe 14 of the above 1st, and 2nd closing motion Itabe 15 with the edges-on-both-sides section of the longitudinal direction.

[0025] The engagement sections 17 and 18 which engage with the slot formed in the lateral-surface section of a cartridge along the slide direction of the shutter member 13, and make the shutter member 13 concerned as sliding is free are prepared for this connection Itabe 16. Moreover, the shutter lidding actuation hole 19 with which lidding actuation of the above-mentioned shutter member 13 is automatically carried out by the shutter lidding operating member prepared in a record regenerative-apparatus side is prepared for this connection Itabe 16. The above-mentioned shutter switching operation hole 19 is established as a hole which makes the shape of a flat-surface rectangle into above-mentioned connection Itabe's 16 abbreviation central part.

[0026] And the shutter member 13 constituted as mentioned above is made as [move / cover the location which lids the opening window part 10 for head insertion, and the 1st opening 11, and the location which makes the opening window part 10 for these head insertion, and the 1st opening 11 open with the slide to the above-mentioned cartridge, and], when the engagement sections 17 and 18 engage with the slot established in the lateral-surface section of the above-mentioned cartridge 2. In addition, in the above-mentioned cartridge, light pro TEKU 21 the shutter lock 20 and for incorrect record prevention which locks the shutter member 13 is arranged.

[0027] And by the disk cartridge of this example, the lobe 22 which engages with the feed hole 9 established in the core of a metal plate 7 is especially formed in the upper half's 2 internal-surface 2a. Toward the bottom half 3 side of the above, as the above-mentioned lobe 22 projects in the location which carries out phase opposite with the feed hole 9 of the metal plate 7 arranged in the core of the magneto-optic disk 1 contained by the cartridge free [rotation], it is formed in it. And let this lobe 22 be the width of face of extent which does not contact this metal plate 7 at the time of disk rotation after chucking by the disk rotation driving means while it is made into the die length of extent from which a metal plate 7 does not separate from the disk substrate 4 at least. In addition, although it is not limited, when the ease of making is taken into consideration, the shape of a cylindrical shape is desirable [especially the configuration of the above-mentioned lobe 22].

[0028] A metal plate 7 can be made to hold in the loosely-fitting condition to the disk substrate 4, without carrying out sault EJINGU processing of the disk substrate 4 by protruding on the upper half's 2 internal-surface 2a the lobe 22 which engages with the feed hole 9 of a metal plate 7 as mentioned above. Therefore, deformation of the disk substrate 4 by carrying out sault EJINGU processing can be prevented, and it can avoid un-arranging, such as effect on a birefringence, and a crack of the disk substrate 4. Moreover, since the sault EJINGU process which is a complicated process can be skipped, reduction of the processes which produce a disk cartridge, and improvement in the yield can be aimed at, and a large cost cut is attained. Furthermore, since loosely-fitting maintenance of the metal plate 7 can be carried out in the completely free condition to the disk substrate 4, deformation of the disk substrate 4 produced from the difference of the coefficient of thermal expansion of a metal plate 7 and the disk substrate 4 can be prevented.

[0029] By the way, in order to produce an above-mentioned disk cartridge, it carries out as follows. First, as shown in drawing 3 , the upper half 2 is set on his back so that internal-surface 2a in which the lobe 22 was formed may become facing up. Next, a feed hole 9 is made to engage with this lobe 22, and a metal plate 7 is attached in the upper half 2.

[0030] Subsequently, as shown in drawing 4 , the disk substrate 4 is laid so that a metal plate 7 may be contained by the metal plate receipt crevice 8. And finally the bottom half 3 is combined with the upper half 2 in piles.

[0031] In addition, although the above-mentioned example explained the magneto-optic disk 1 as an example of the disk cartridge contained to the cartridge, an optical disk can apply this invention also to the disk cartridge contained by the cartridge, and the operation effectiveness is the same.

[0032]

[Effect of the Invention] It can be made to hold in the loosely-fitting condition, without carrying out sault EJINGU

processing, since the lobe which engages with the feed hole established in the core of the metal plate for chucking in the disk cartridge concerning this invention is prepared for the upper half so that clearly also from the above explanation, without separating from a metal plate to a disk substrate. By this, the load to a disk substrate can be lost entirely, the crack of a disk substrate etc. can be avoided in the effect list to a birefringence, and good record playback can be performed in the large improvement list of a signal property.

[0033] Moreover, in the disk cartridge concerning this invention, since sault EJINGU processing is omissible, while the production processes which produce a disk cartridge are sharply reducible, improvement and a large cost cut of the yield can be attained.

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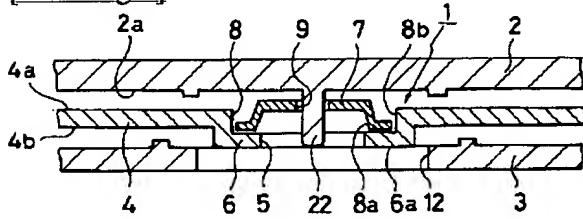
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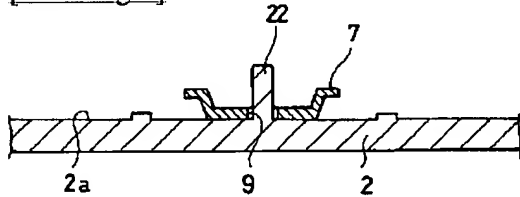
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DRAWINGS

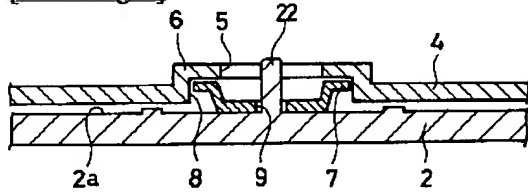
[Drawing 2]



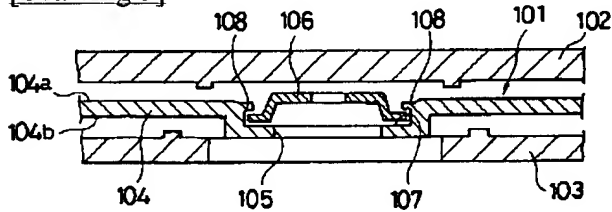
[Drawing 3]



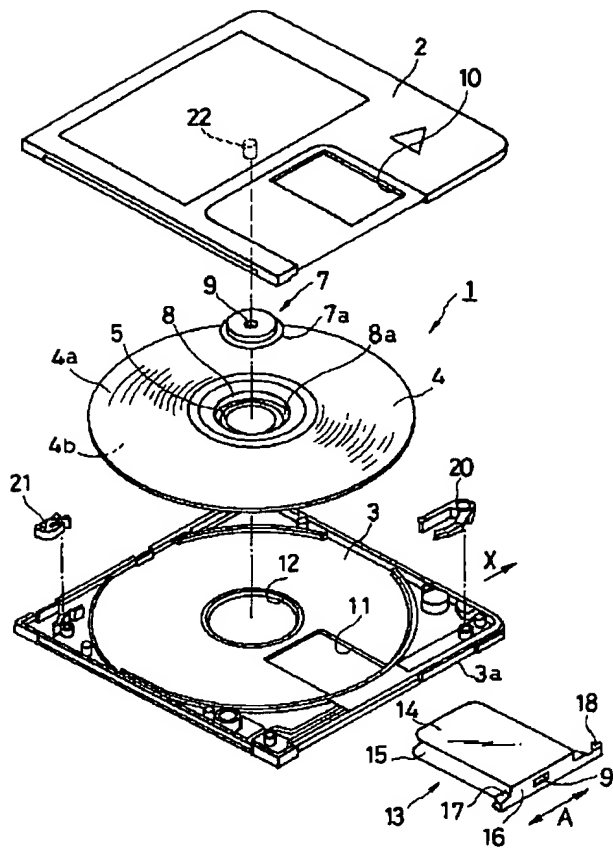
[Drawing 4]



[Drawing 5]



[Drawing 1]



[Translation done.]